MICROFLUIDIC NUCLEIC ACID ANALYSIS

ABSTRACT OF THE DISCLOSURE

Nucleic acid from cells and viruses sampled from a variety of environments may purified and expressed utilizing microfluidic techniques. In accordance with one embodiment of the present invention, individual or small groups of cells or viruses may be isolated in microfluidic chambers by dilution, sorting, and/or segmentation. The isolated cells or viruses may be lysed directly in the microfluidic chamber, and the resulting nucleic acid purified by exposure to affinity beads. Subsequent elution of the purified nucleic acid may be followed by ligation and cell transformation, all within the same microfluidic chip. In one specific application, cell isolation, lysis, and nucleic acid purification may be performed utilizing a highly parallelized microfluidic architecture to construct gDNA and cDNA libraries.